FIG. 1 (a)

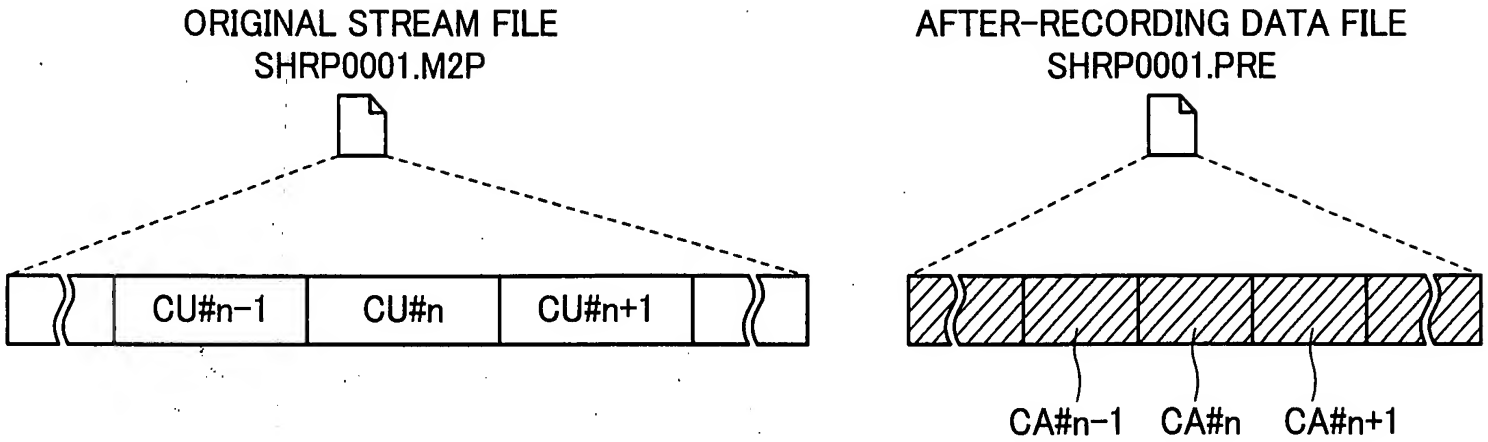
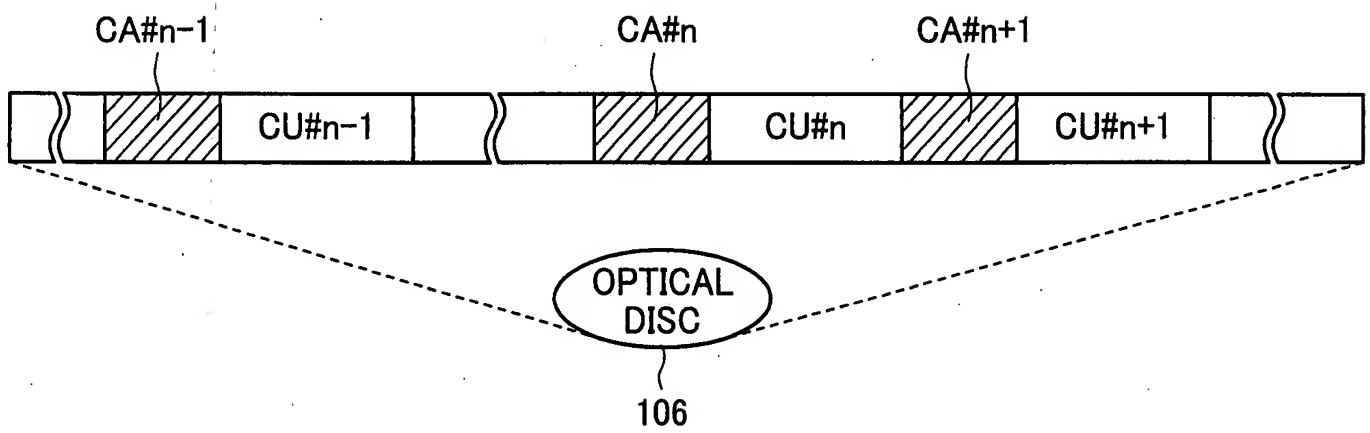


FIG. 1 (b)



10/531534

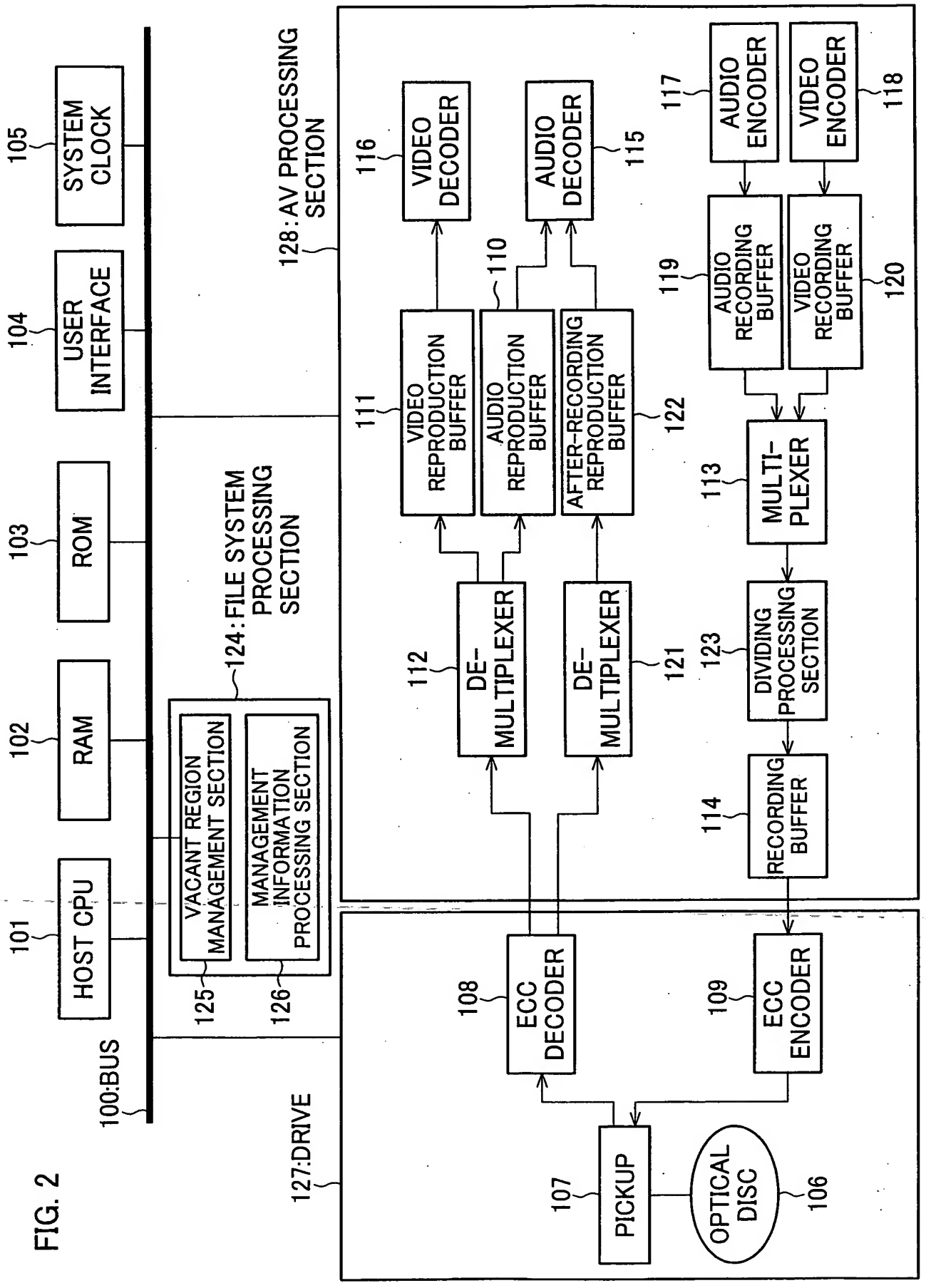

HOST CPU
101
RAM
102
ROM
103
USER INTERFACE
104
SYSTEM CLOCK
105
100:BUS
124:FILE SYSTEM PROCESSING SECTION
VACANT REGION MANAGEMENT SECTION
125
MANAGEMENT INFORMATION PROCESSING SECTION
126
128:AV PROCESSING SECTION
VIDEO DECODER
116
AUDIO DECODER
115
AUDIO ENCODER
117
VIDEO ENCODER
118
110
VIDEO REPRODUCTION BUFFER
111
AUDIO REPRODUCTION BUFFER
AFTER-RECORDING REPRODUCTION BUFFER
122
AUDIO RECORDING BUFFER
119
VIDEO RECORDING BUFFER
120
DE-MULTIPLEXER
112
DE-MULTIPLEXER
121
MULTI-PLEXER
113
DIVIDING PROCESSING SECTION
123
RECORDING BUFFER
114
127:DRIVE
ECC DECODER
108
ECC ENCODER
109
PICKUP
107
OPTICAL DISC
106

FIG. 2

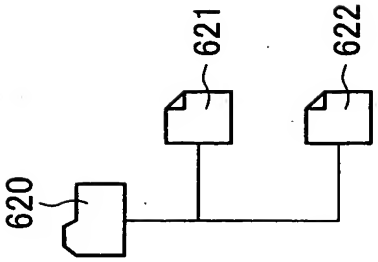

620
621
622

FIG. 3 (a)

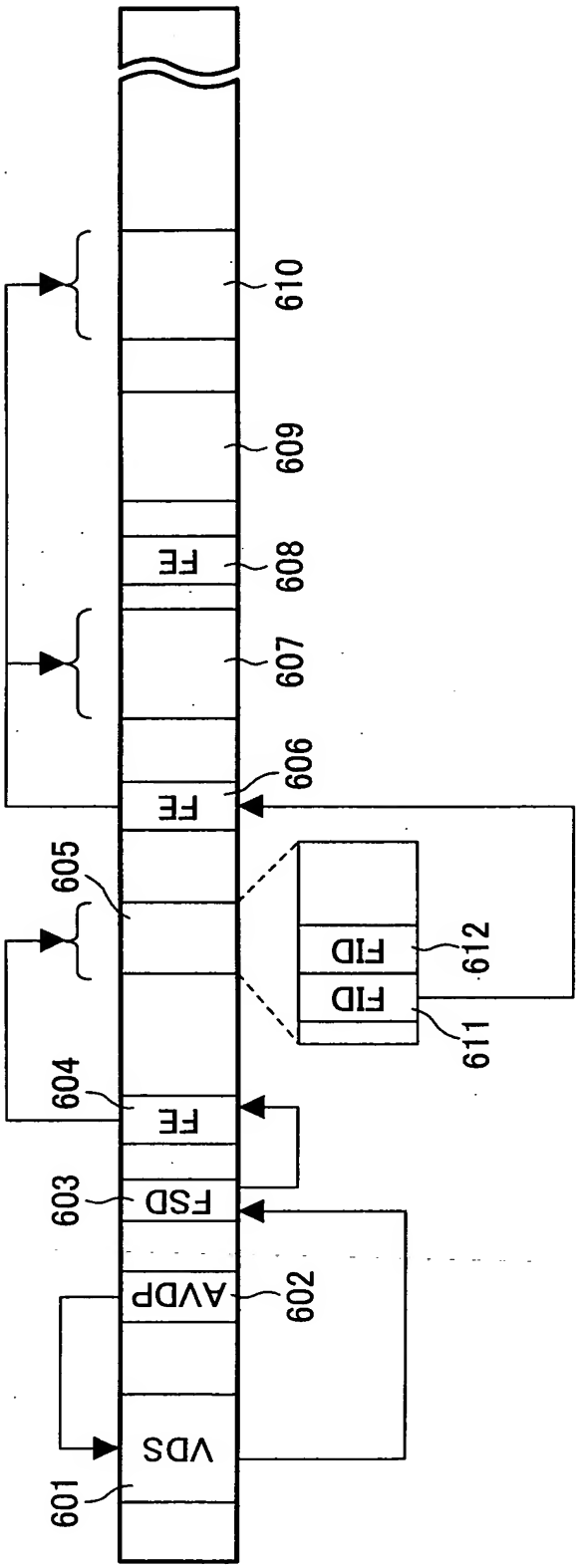
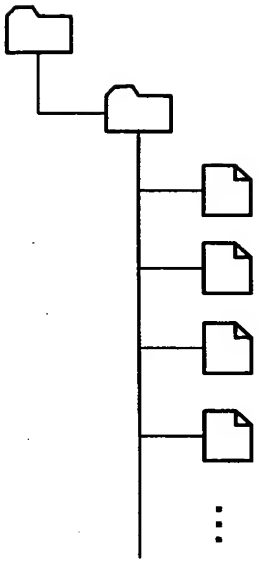

601
VDS
602
AVDP
603
FSD
604
FE
605
606
FE
607
609
610
FE
608
FID
FID
611
612

FIG. 3 (b)

FIG. 4



100SHARP

SHRP0001.PGM	PROGRAM INFORMATION FILE
SHRP0001.OMI	ORIGINAL STREAM MANAGEMENT INFORMATION FILE
SHRP0001.M2P	ORIGINAL STREAM FILE
SHRP0001.PRE	AFTER-RECORDING DATA FILE

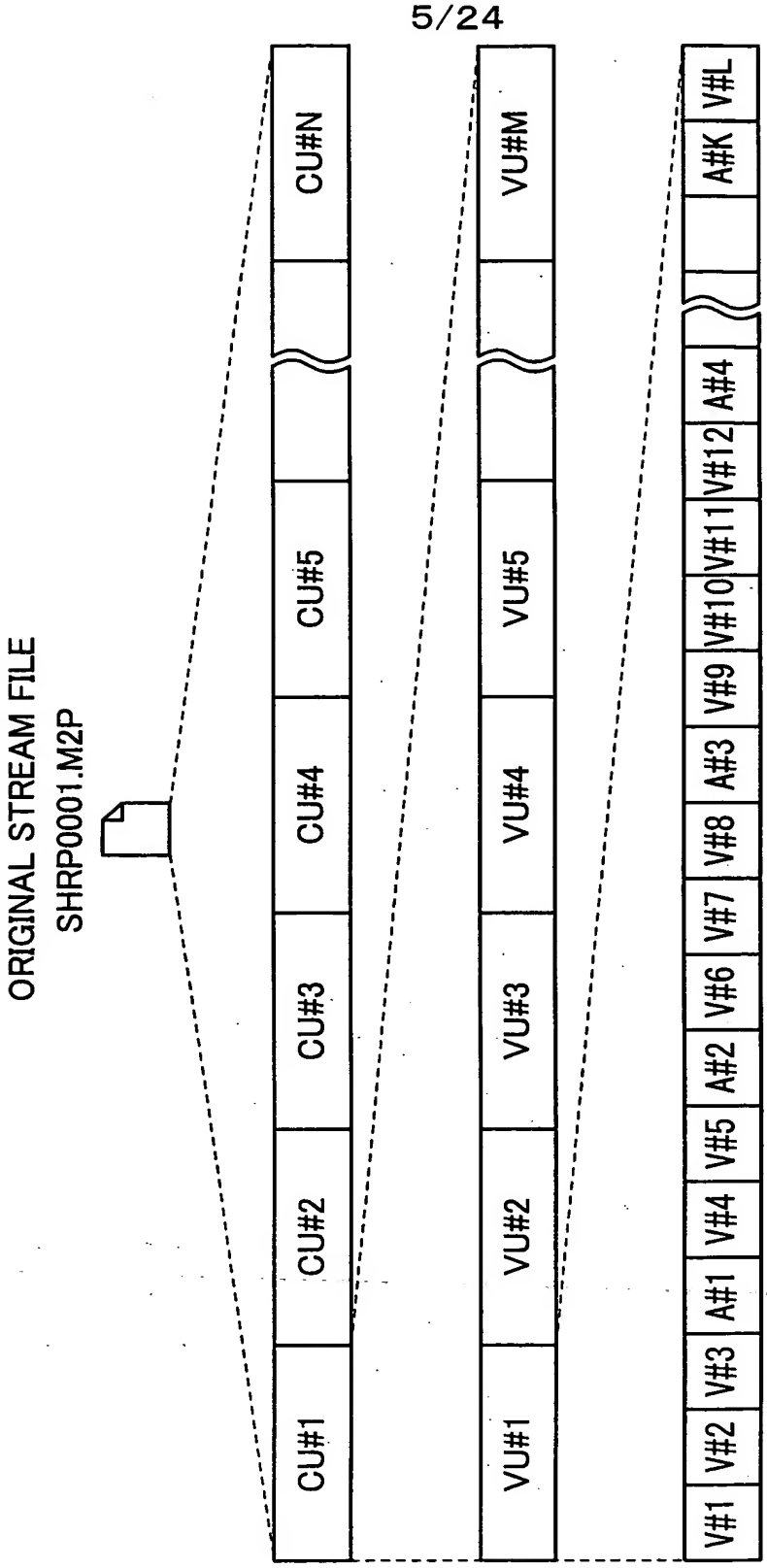


FIG. 5 (a)

FIG. 5 (b)

FIG. 5 (c)

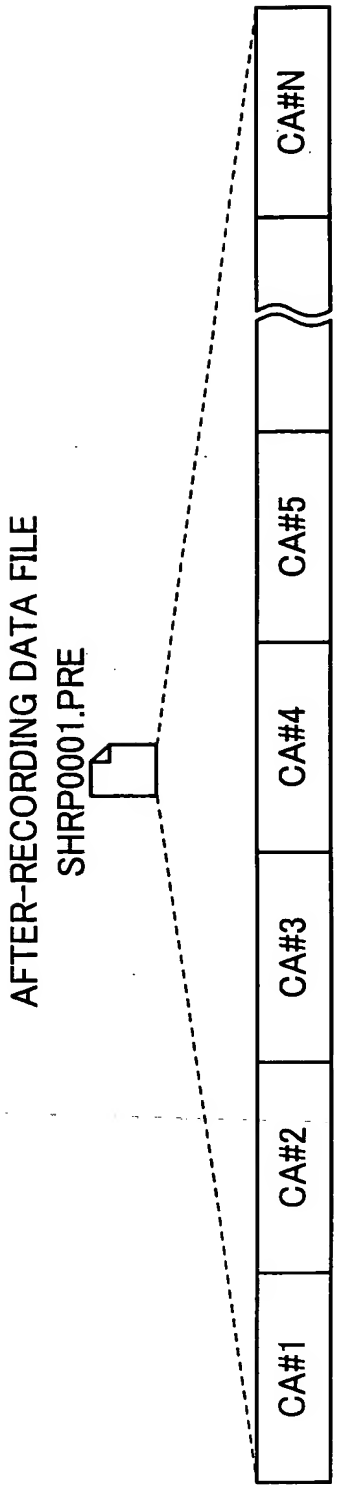

AFTER-RECORDING DATA FILE
SHRP0001.PRE
CA#1
CA#2
CA#3
CA#4
CA#5
CA#N

FIG. 6

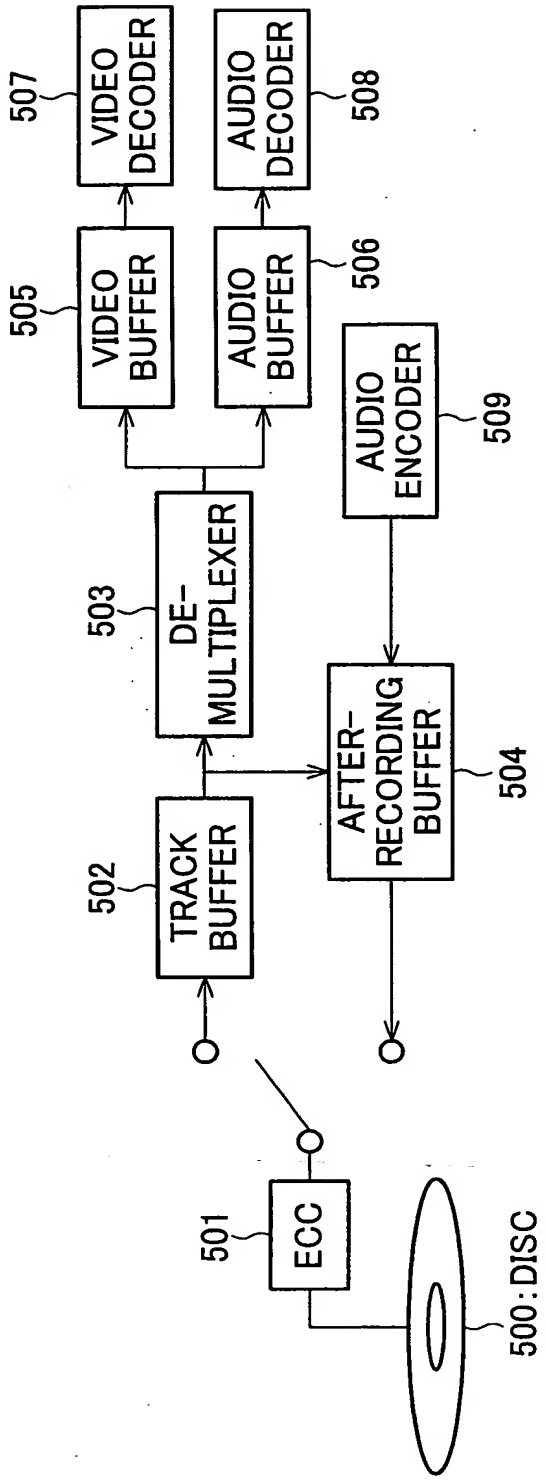

500:DISC
501
ECC
502
TRACK BUFFER
503
DE-MULTIPLEXER
504
AFTER-RECORDING BUFFER
505
VIDEO BUFFER
506
AUDIO BUFFER
507
VIDEO DECODER
508
AUDIO DECODER
509
AUDIO ENCODER

FIG. 7

FIG. 8

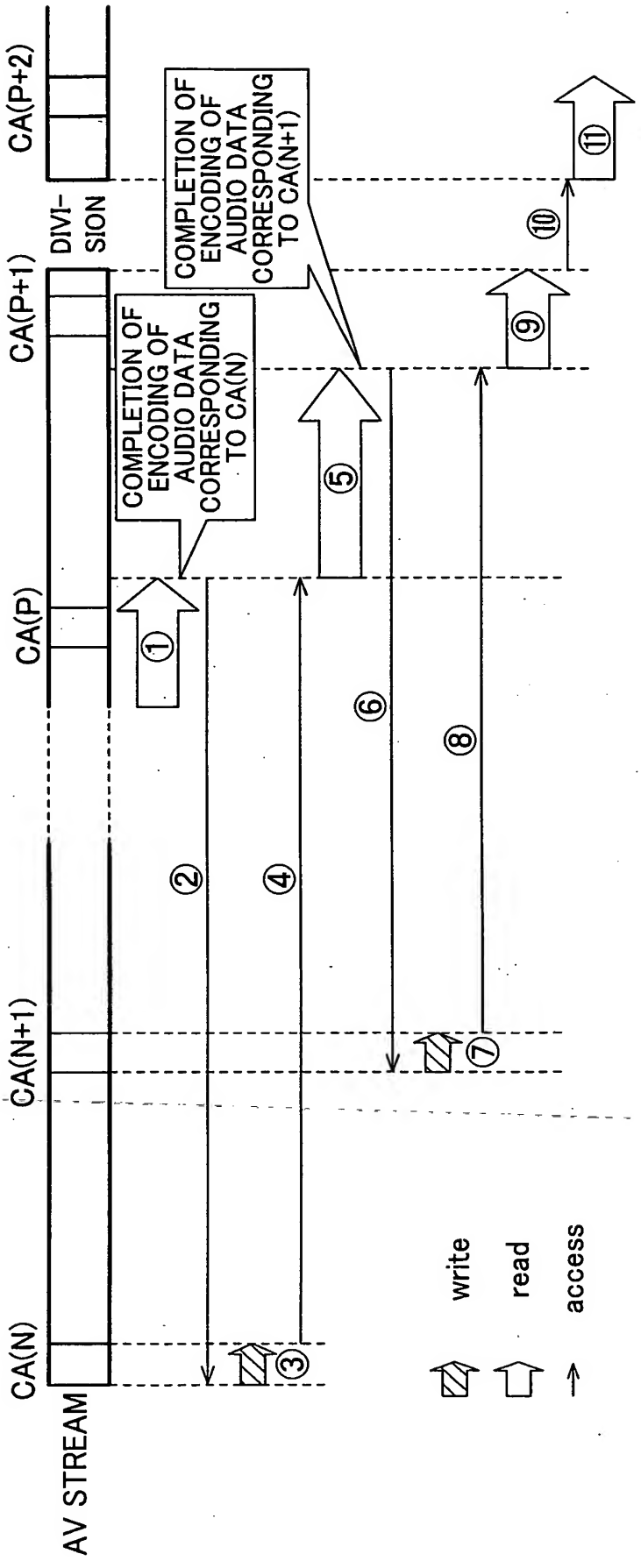

AV STREAM
CA(N)
CA(N+1)
CA(P)
CA(P+1)
DIVI-SION
CA(P+2)
COMPLETION OF ENCODING OF AUDIO DATA CORRESPONDING TO CA(N)
COMPLETION OF ENCODING OF AUDIO DATA CORRESPONDING TO CA(N+1)
①
②
③
④
⑤
⑥
⑦
⑧
⑨
⑩
⑪
write
read
access

FIG. 9

```
STREAM MANAGEMENT INFORMATION FILE {
                        o_attribute()
                        video_unit_table()
                        p_attribute()
                        continuous_area_table()

}
```

FIG. 10 (a)

```
video_unit_table() {
        number_of_video_unit
        for (i=0; i<number_of_video_unit; i++){
                video_unit_info()
        }
}
```

FIG. 10 (b)

```
video_unit_info() {
        VU_flags
        VU_PTS
        VU_PN
}
```

FIG. 11 (a)

```
VU_flags(){
        first_unit_flag
}
```

FIG. 11 (b)

first_unit_flag	0b	NOT POSITIONED IN HEAD OF CU
	1b	POSITIONED IN HEAD OF CU

FIG. 12 (a)

```
continuous_area_table() {
        number_of_continuous_area
        for (i=0; i<number_of_continuous_area; i++){
                continuous_area_info()
        }
}
```

FIG. 12 (b)

```
continuous_area_info() {
        CA_flags
        CA_PTS
        CA_PN
}
```

FIG. 13 (a)

```
CA_flags(){
        placement_flag
}
```

FIG. 13 (b)

placement_flag	0b	NOT POSITIONED JUST BEFORE RELEVANT CU
	1b	POSITIONED JUST BEFORE RELEVANT CU

FIG. 14

```
PROGRAM INFORMATION FILE {
                pg_attribute()
                scene_table()
}
```

FIG. 15 (a)

```
scene_table() {
        number_of_scene
        for (i=0; i<number_of_scene; i++){
                scene_info()
        }
}
```

FIG. 15 (b)

```
scene_info() {
        sc_filename
        sc_start_PTS
        sc_duration
}
```

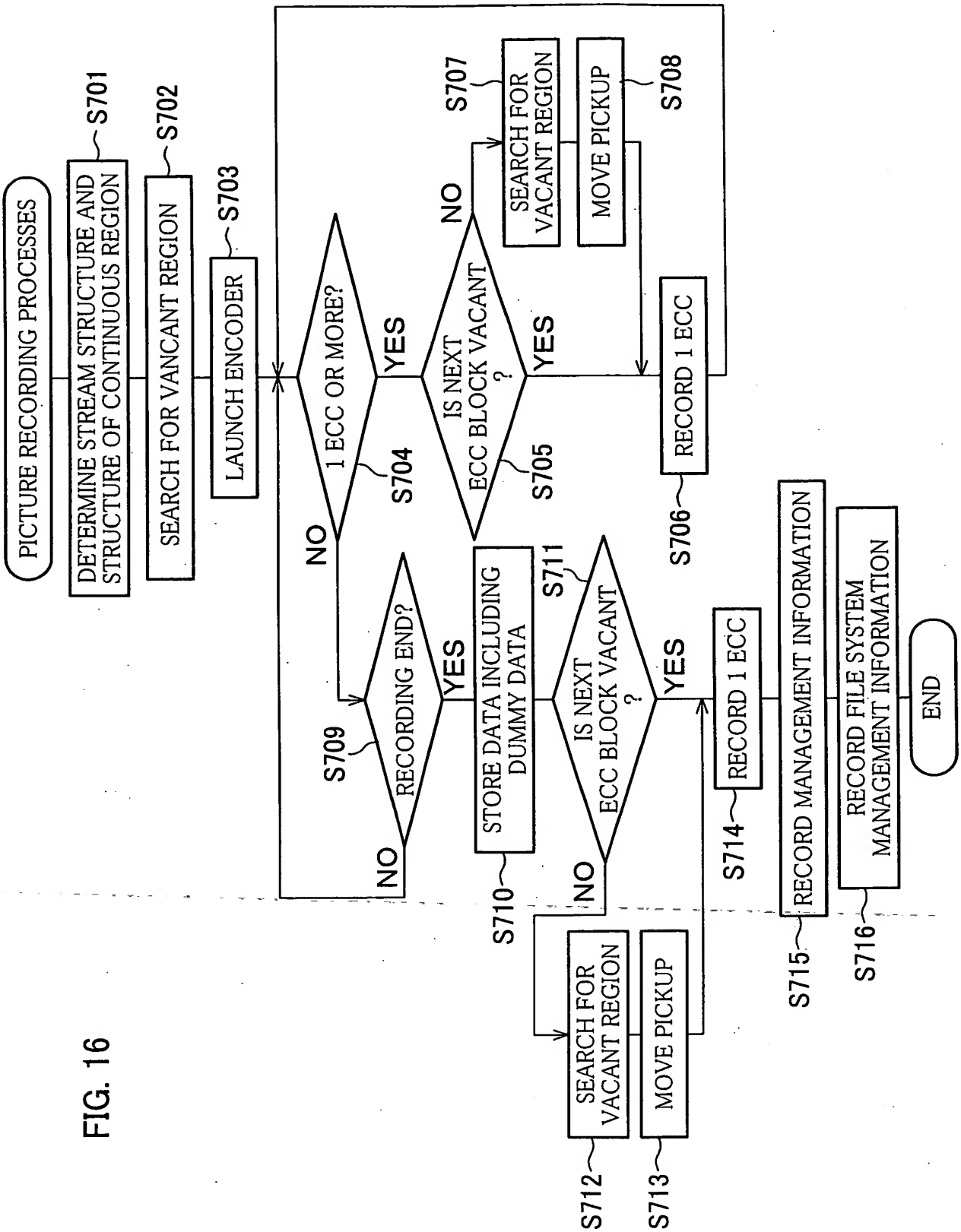

PICTURE RECORDING PROCESSES
DETERMINE STREAM STRUCTURE AND STRUCTURE OF CONTINUOUS REGION
S701
SEARCH FOR VANCANT REGION
S702
LAUNCH ENCODER
S703
1 ECC OR MORE?
S704
YES
NO
IS NEXT ECC BLOCK VACANT ?
S705
YES
NO
SEARCH FOR VACANT REGION
S707
MOVE PICKUP
S708
RECORD 1 ECC
S706
RECORDING END?
S709
YES
NO
STORE DATA INCLUDING DUMMY DATA
S710
IS NEXT ECC BLOCK VACANT ?
S711
YES
NO
SEARCH FOR VACANT REGION
S712
MOVE PICKUP
S713
RECORD 1 ECC
S714
RECORD MANAGEMENT INFORMATION
S715
RECORD FILE SYSTEM MANAGEMENT INFORMATION
S716
END

FIG. 16

FIG. 17

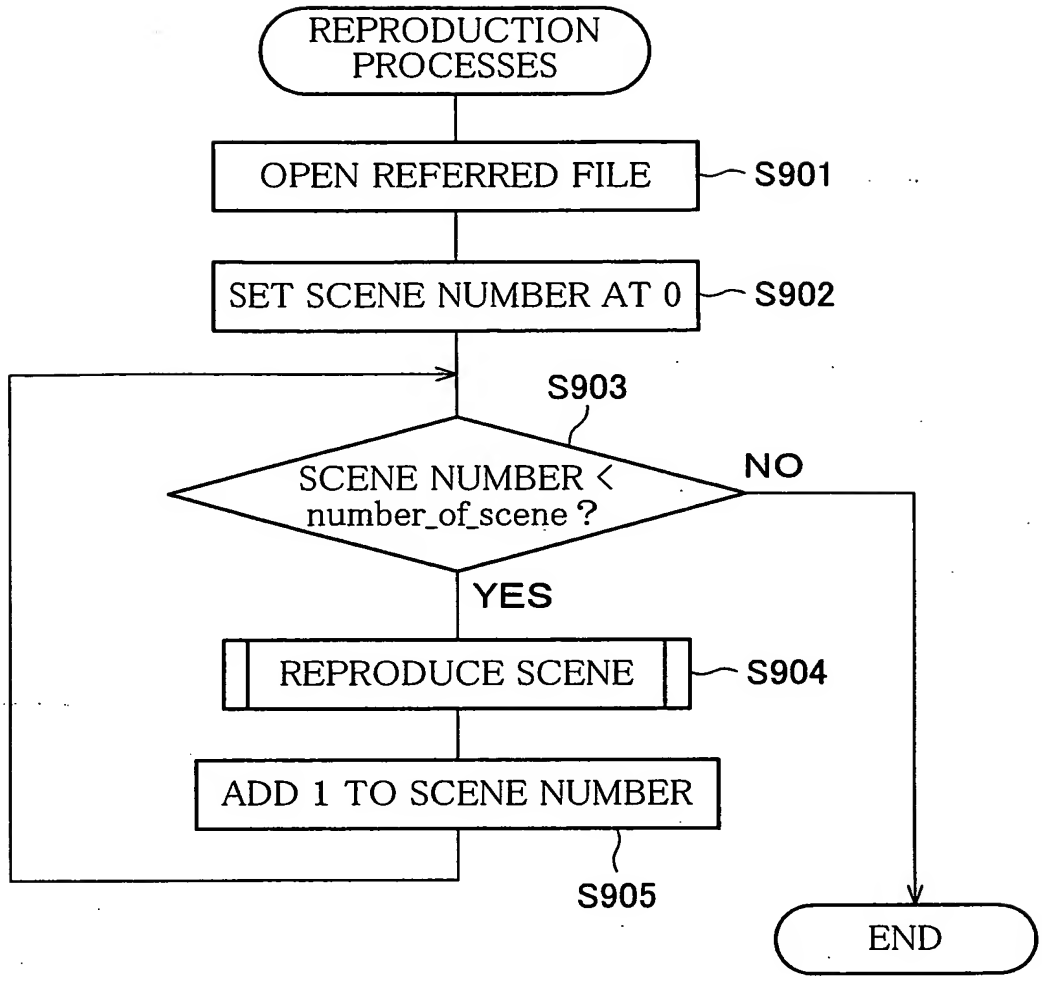

REPRODUCTION PROCESSES
OPEN REFERRED FILE
S901
SET SCENE NUMBER AT 0
S902
S903
SCENE NUMBER < number_of_scene ?
NO
YES
REPRODUCE SCENE
S904
ADD 1 TO SCENE NUMBER
S905
END

FIG. 18

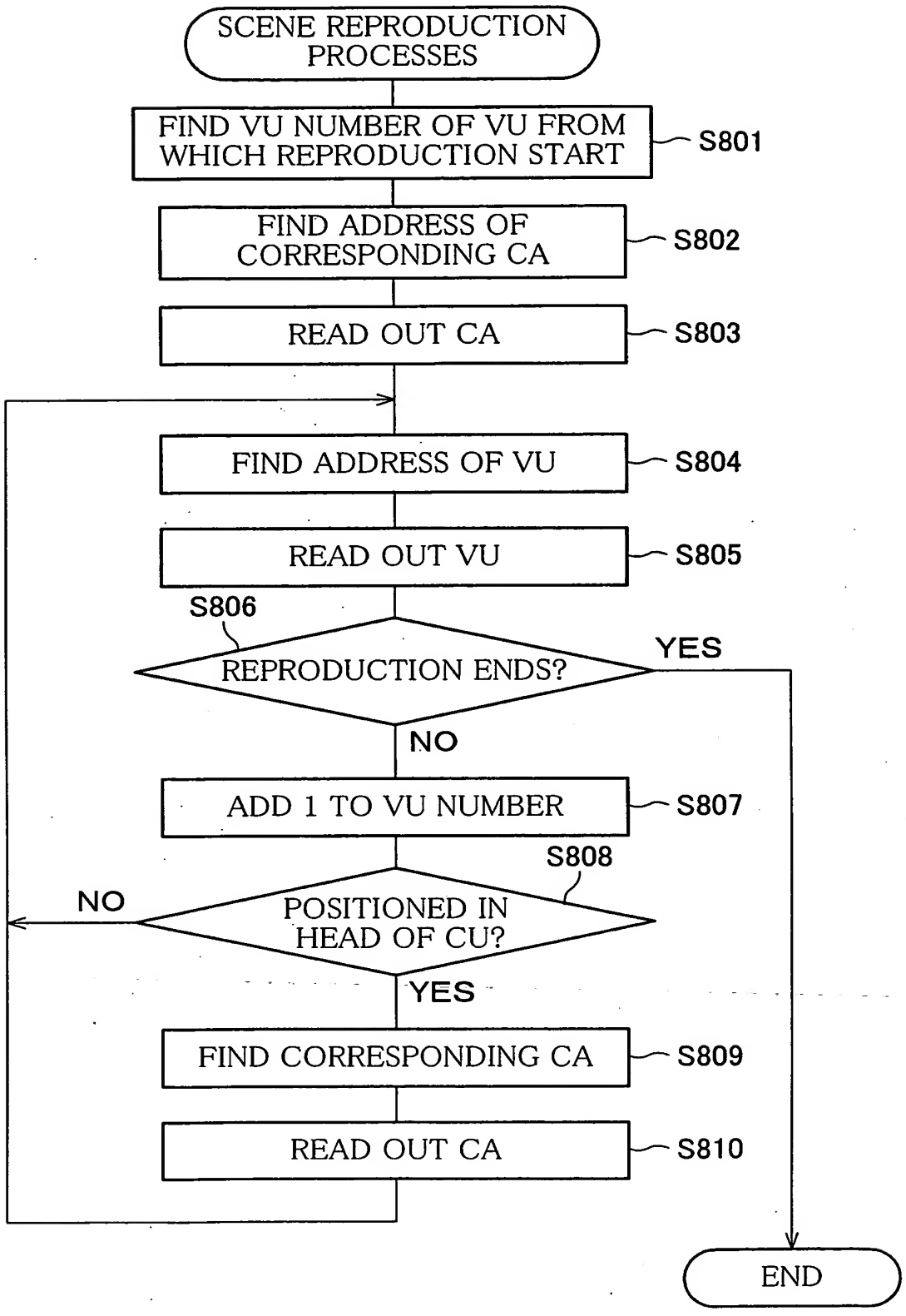

SCENE REPRODUCTION PROCESSES
FIND VU NUMBER OF VU FROM WHICH REPRODUCTION START
S801
FIND ADDRESS OF CORRESPONDING CA
S802
READ OUT CA
S803
FIND ADDRESS OF VU
S804
READ OUT VU
S805
S806
REPRODUCTION ENDS?
YES
NO
ADD 1 TO VU NUMBER
S807
S808
NO
POSITIONED IN HEAD OF CU?
YES
FIND CORRESPONDING CA
S809
READ OUT CA
S810
END

FIG. 19 (a)

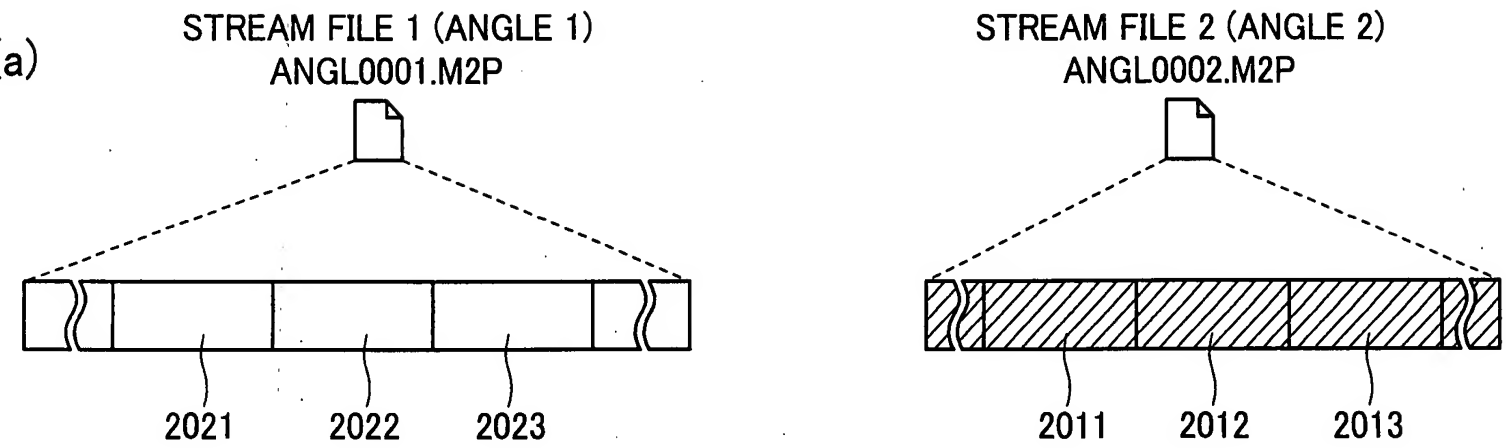
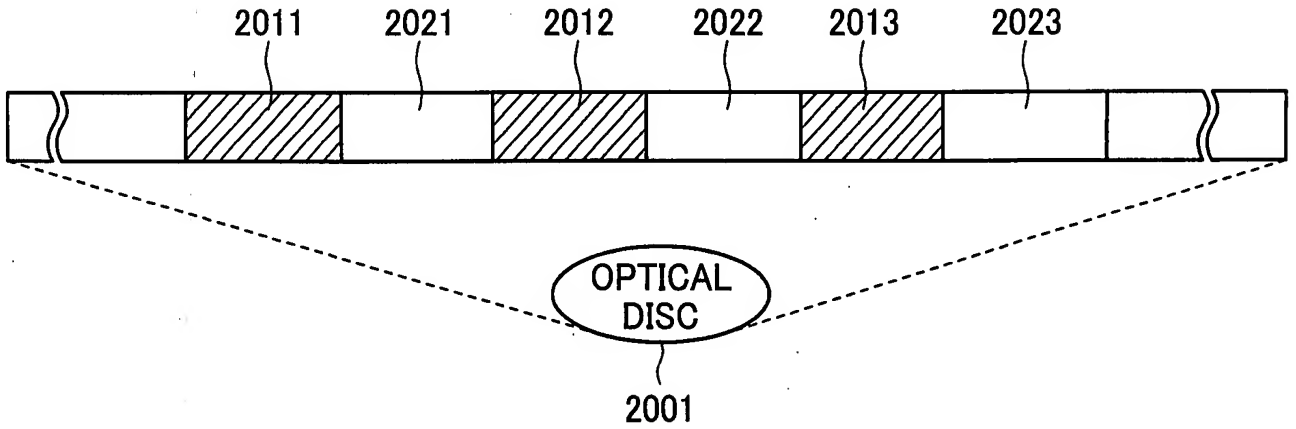


FIG. 19 (b)



10/531534

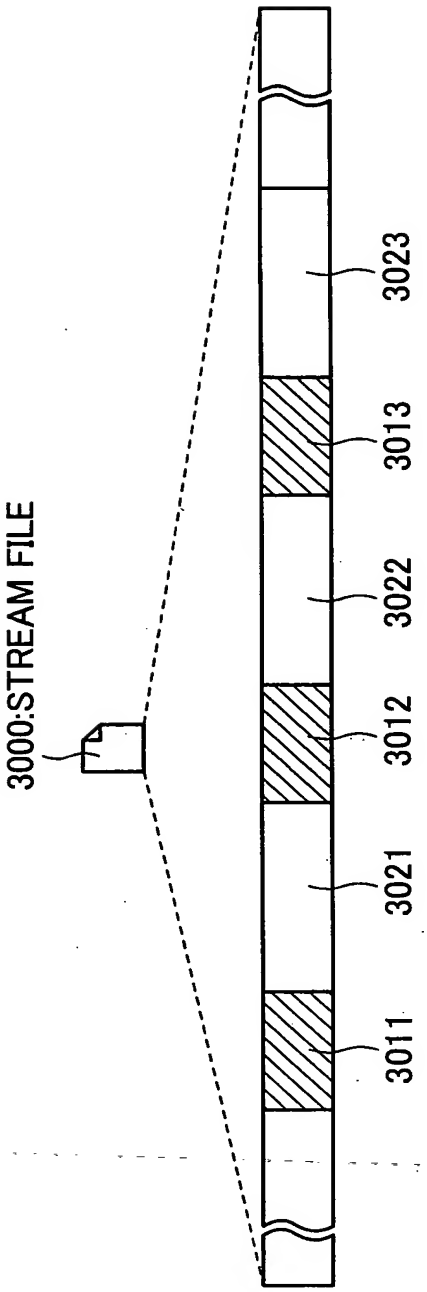


FIG. 20 (a)

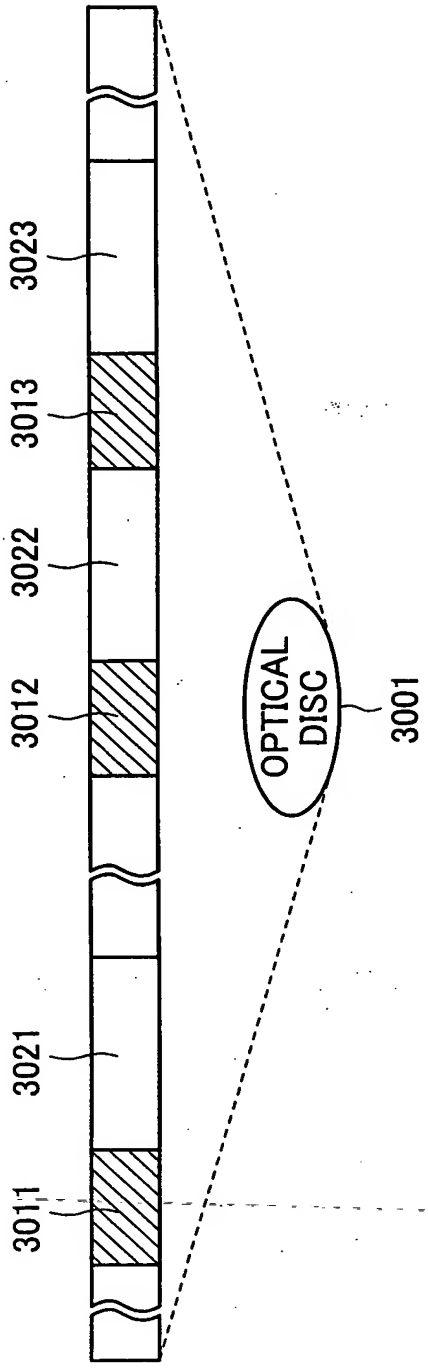


FIG. 20 (b)

FIG. 21

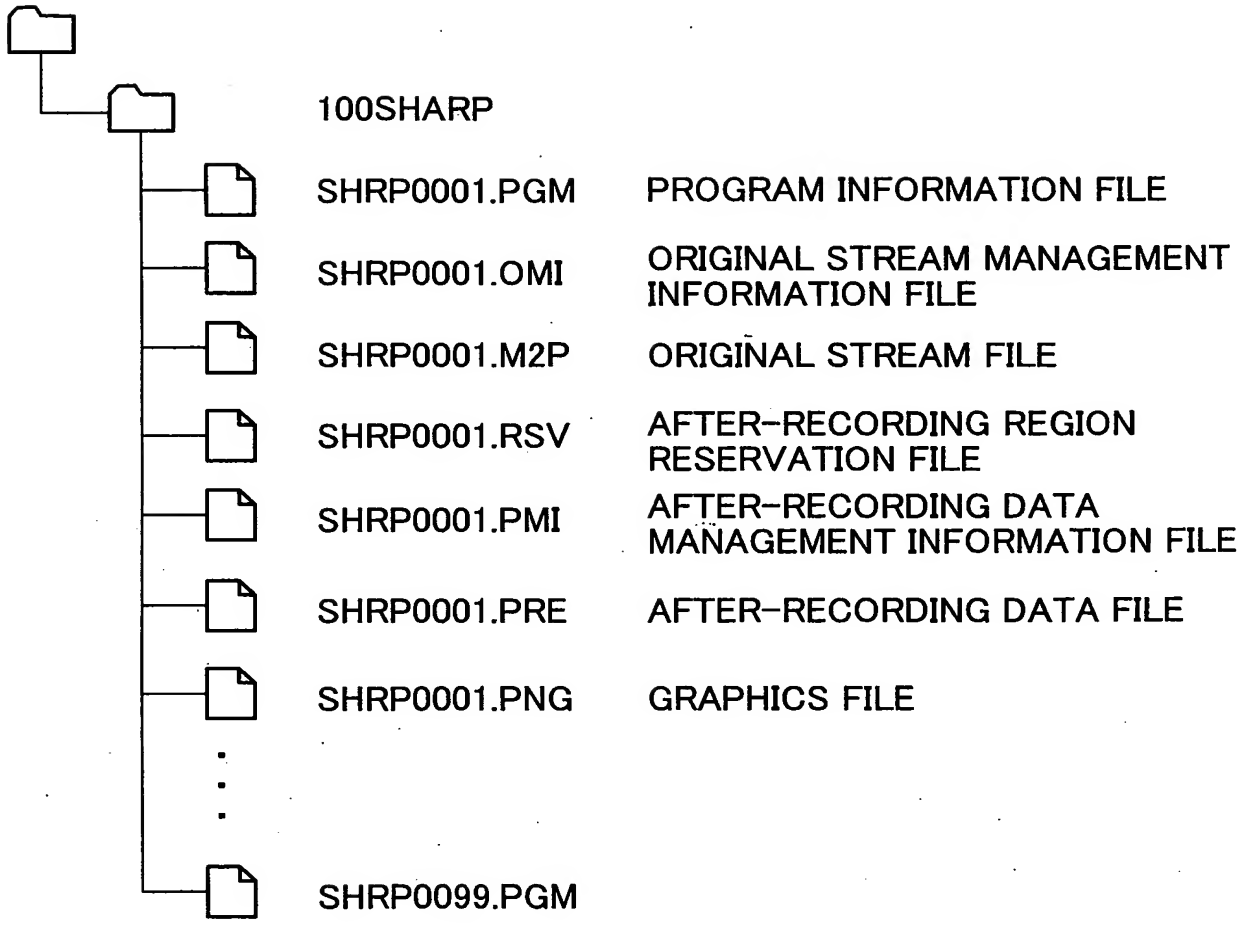

100SHARP
SHRP0001.PGM
PROGRAM INFORMATION FILE
SHRP0001.OMI
ORIGINAL STREAM MANAGEMENT INFORMATION FILE
SHRP0001.M2P
ORIGINAL STREAM FILE
SHRP0001.RSV
AFTER-RECORDING REGION RESERVATION FILE
SHRP0001.PMI
AFTER-RECORDING DATA MANAGEMENT INFORMATION FILE
SHRP0001.PRE
AFTER-RECORDING DATA FILE
SHRP0001.PNG
GRAPHICS FILE
SHRP0099.PGM

FIG. 22 (a)

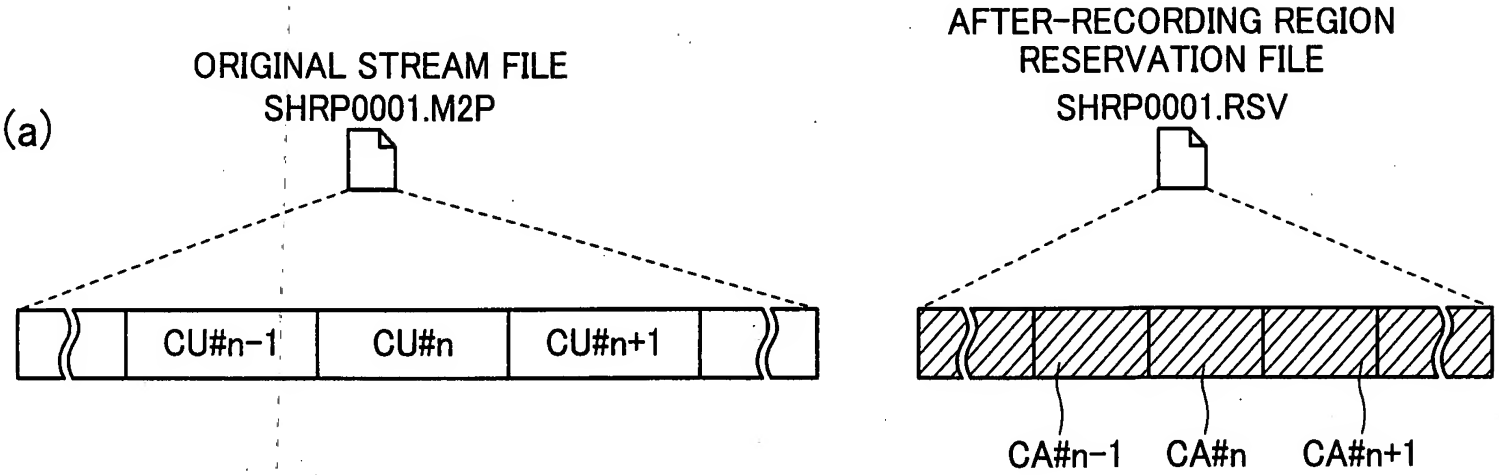
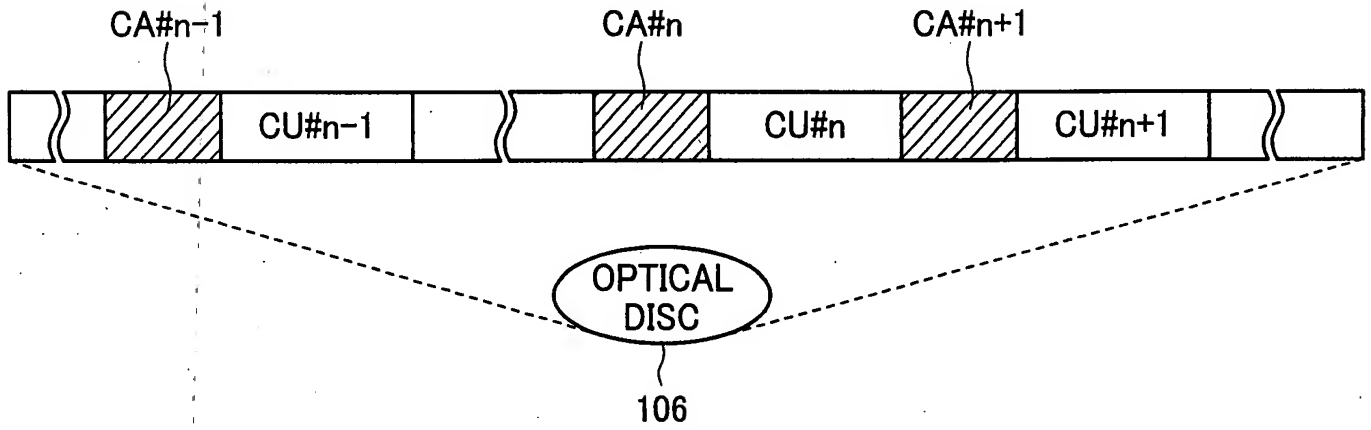


FIG. 22 (b)



10/531554

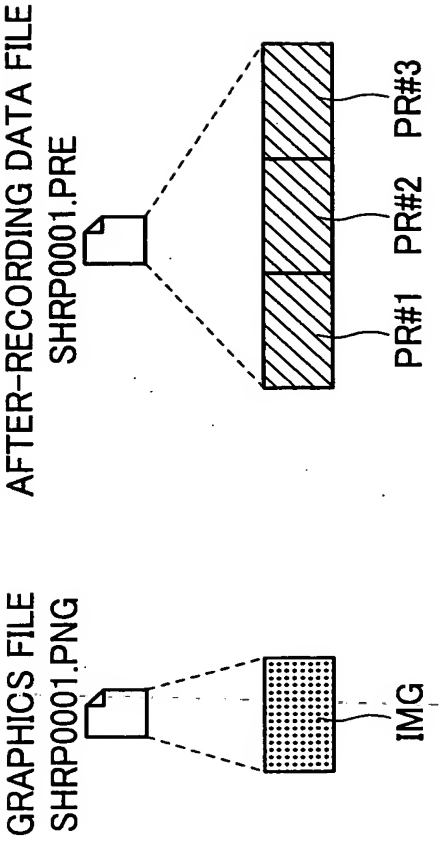


FIG. 23 (a)

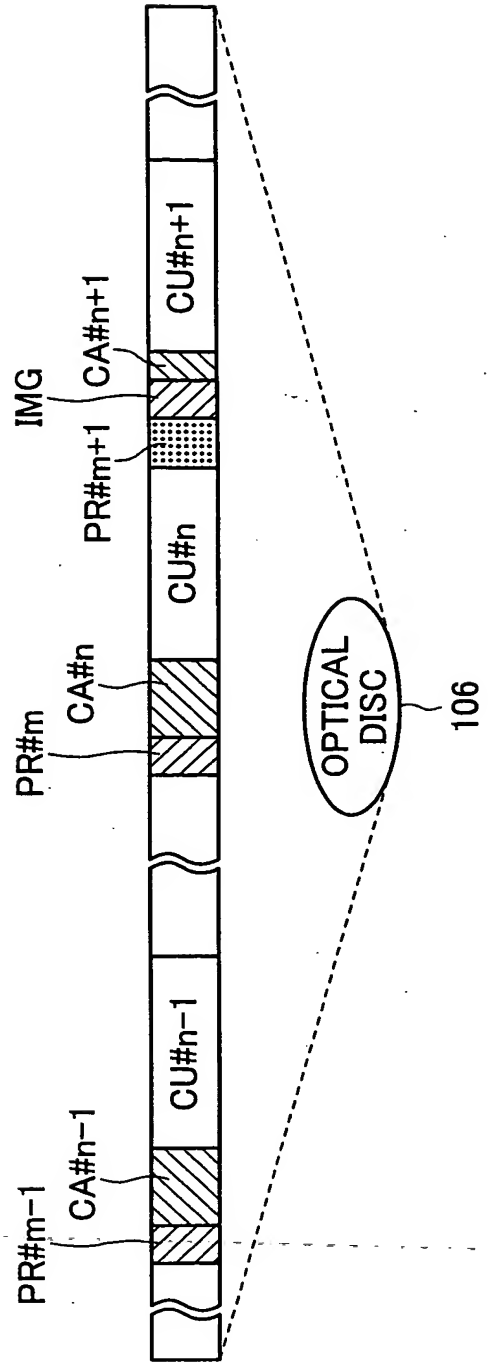


FIG. 23 (b)

FIG. 24

```
PROGRAM INFORMATION FILE {
                    pg_attribute()
                    scene_table()
                    subaudio_table()
                    graphics_table()
}
```

FIG. 25 (a)

```
subaudio_table() {
        number_of_subaudio
        for (i=0; i<number_of_subaudio; i++){
                subaudio_info()
        }
}
```

FIG. 25 (b)

```
subaudio_info() {
        SA_filename
        SA_flags
        SA_start_time
        SA_duration
}
```

FIG. 26 (a)

```
graphics_table() {
        number_of_graphics
        for (i=0; i<number_of_graphics; i++){
                graphics_info()
        }
}
```

FIG. 26 (b)

```
graphics_info() {
        gr_filename
        gr_flags
        gr_start_time
        gr_duration
}
```

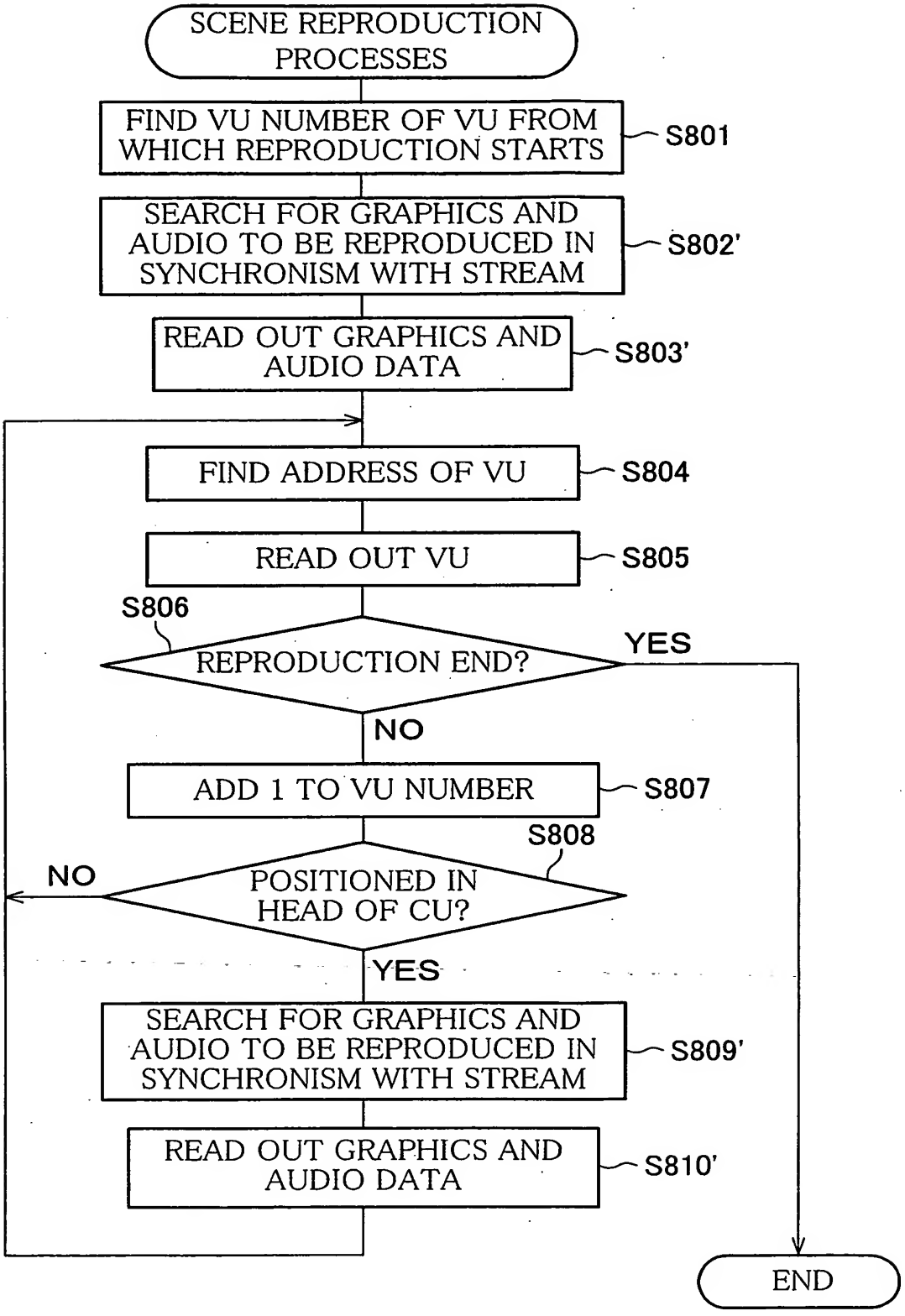
FIG. 27 (a)

```
SA_flags/gr_flags(){
        interleaved_flag
}
```

FIG. 27 (b)

interleaved_flag	0b	NOT POSITIONED JUST BEFORE RELEVANT CU
	1b	POSITIONED JUST BEFORE RELEVANT CU

FIG. 28


SCENE REPRODUCTION PROCESSES
FIND VU NUMBER OF VU FROM WHICH REPRODUCTION STARTS
S801
SEARCH FOR GRAPHICS AND AUDIO TO BE REPRODUCED IN SYNCHRONISM WITH STREAM
S802'
READ OUT GRAPHICS AND AUDIO DATA
S803'
FIND ADDRESS OF VU
S804
READ OUT VU
S805
S806
REPRODUCTION END?
YES
NO
ADD 1 TO VU NUMBER
S807
S808
NO
POSITIONED IN HEAD OF CU?
YES
SEARCH FOR GRAPHICS AND AUDIO TO BE REPRODUCED IN SYNCHRONISM WITH STREAM
S809'
READ OUT GRAPHICS AND AUDIO DATA
S810'
END

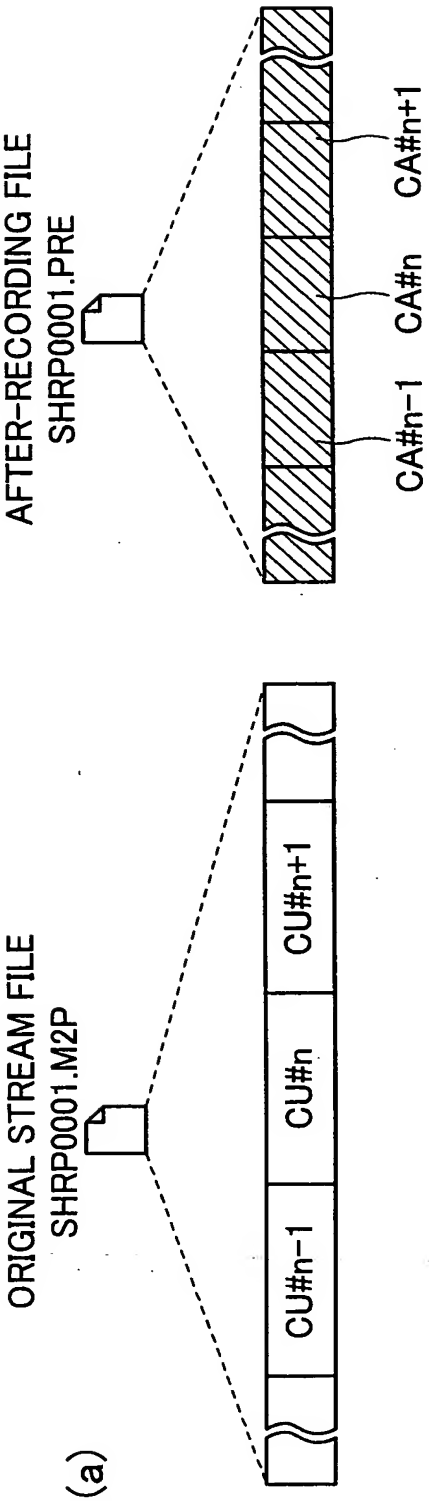


FIG. 29 (a)

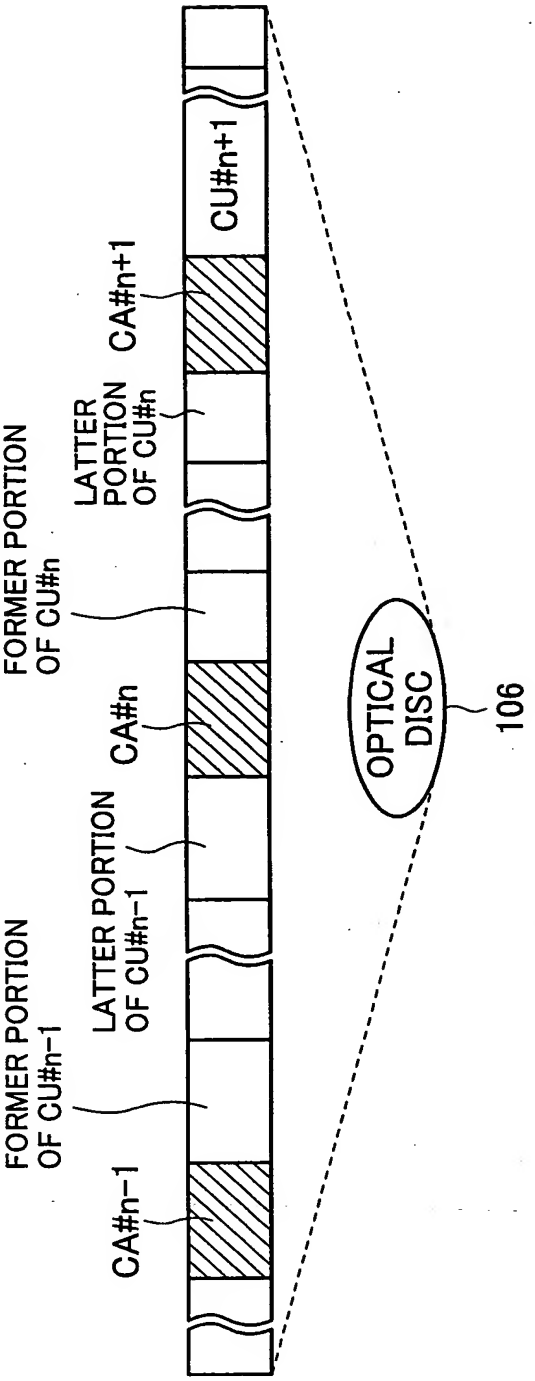


FIG. 29 (b)

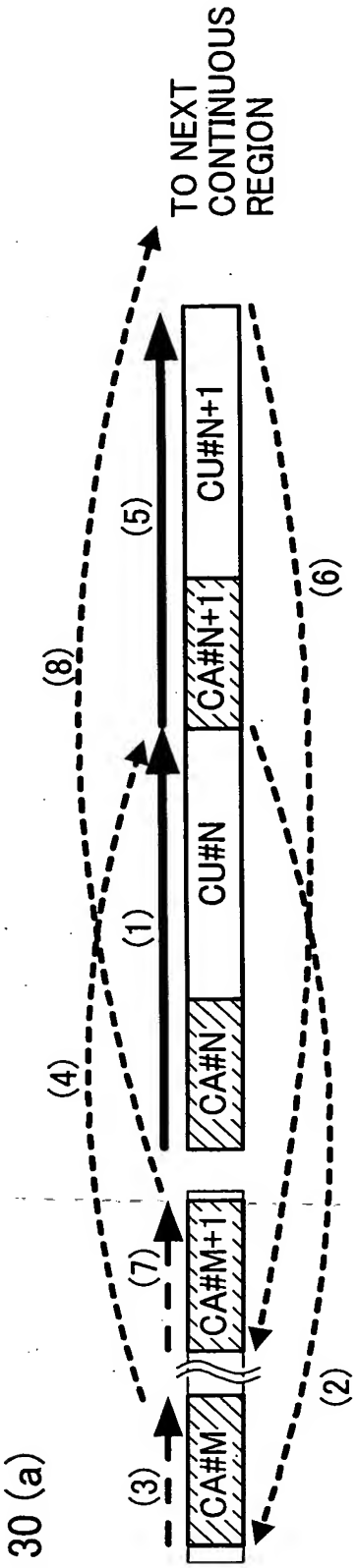


FIG. 30 (a)

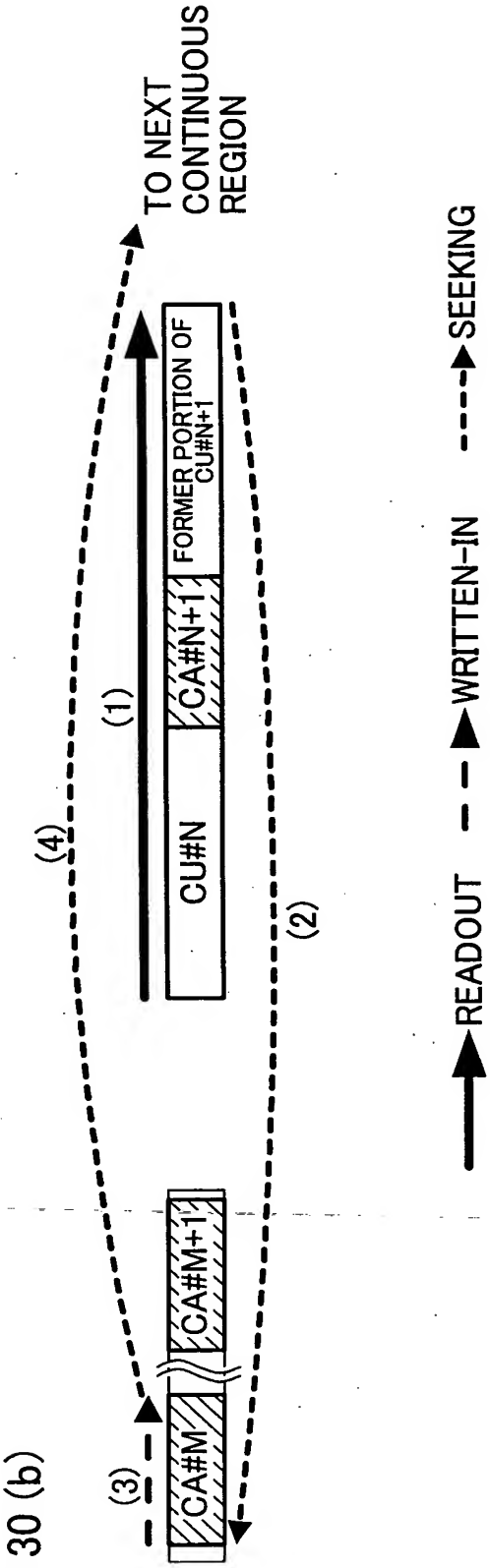


FIG. 30 (b)